Claims

1. A glass container comprising:

a body formed from a Type I, Class B glass composition according to ASTM Standard E438-92, the body having an inner surface, an outer surface and a wall thickness extending between the outer surface and the inner surface, wherein the body comprises a compressively stressed layer extending into the wall thickness from at least one of the outer surface and the inner surface; and

a lubricous coating positioned on at least a portion of the outer surface of the body, wherein the outer surface of the body with the lubricous coating has a coefficient of friction less than or equal to 0.7, wherein:

the lubricous coating is a tenacious organic coating;

the lubricous coating has a mass loss of less than about 5% of its mass when heated from a temperature of 150°C to 350°C at a ramp rate of about 10°C/minute; and

the coefficient of friction is a maximum coefficient of friction measured relative to a second glass container in a vial-on-vial testing jig under a normal load of 30 N, the second glass container having a body formed from the Type I, Class B glass composition and comprising the lubricous coating on an at least a portion of the outer surface of a body of the second glass container and subjected to the same environmental conditions prior to measurement.

~~2. The glass container of claim 1, wherein the compressively stressed layer has a surface compressive stress greater than or equal to 150 MPa.~~

~~3. The glass container of claim 1, wherein the compressively stressed layer has a depth of layer greater than or equal to 25 μm.~~

~~4. The glass container of claim 1, wherein the glass container is ion-exchange strengthened.~~

~~5. The glass container of claim 1, wherein the lubricous coating is thermally stable at a temperature of at least about 260°C for 30 minutes.~~

~~6. The glass container of claim 1, wherein the lubricous coating is thermally stable at a temperature of at least about 280°C for 30 minutes.~~

~~7. The glass container of claim 1, wherein a light transmission through the portion of the outer surface of the body with the lubricous coating is greater than or equal to about 55% of a light transmission through an uncoated glass container for wavelengths from about 400 nm to about 700 nm.~~

~~8. The glass container of claim 1, wherein the lubricous coating has a mass loss of less than about 5% of its mass when heated from a temperature of 150°C to 350°C at a ramp rate of about 10°C/minute.~~

~~9. The glass container of claim 1, wherein the lubricous coating comprises a polymer chemical composition and a coupling agent.~~

~~10. The glass container of claim 9, wherein the lubricous coating comprises:~~

~~a coupling agent layer positioned on the outer surface of the body, the coupling agent layer comprising the coupling agent; and~~

~~a polymer layer positioned over the coupling agent layer, the polymer layer comprising the polymer chemical composition.~~

~~11. The glass container of claim 9, wherein the coupling agent comprises at least one of:~~

~~a first silane chemical composition, a hydrolysate thereof, or an oligomer thereof; and~~

~~a chemical composition formed from the oligomerization of at least the first silane chemical composition and a second silane chemical composition, wherein the first silane chemical composition and the second silane chemical composition are different chemical compositions.~~

2. The glass container of claim 1, wherein the glass container is ion-exchange strengthened.

3~~12~~. A glass container comprising:

a body formed from a Type I, Class B glass composition according to ASTM Standard E438-92, the body having a hydrolytic resistance of HGB2 or better according to ISO 719 and an inner surface, an outer surface and a wall thickness extending between the outer surface and the inner surface, wherein the body is ion-exchange strengthened

such that the body comprises a compressively stressed layer extending into the wall thickness from at least one of the outer surface and the inner surface; and

a lubricous coating positioned on at leaston a portion of at least one of the outer surface and the inner surface of the body, wherein the lubricous coating is thermally stable at a temperature of at least about 260°C for 30 minutes wherein the portion of the outer surface of the body with the lubricous coating has a coefficient of friction less than or equal to 0.7, wherein:

the lubricous coating is a tenacious organic coating that is thermally stable at a temperature of at least about 260°C for 30 minutes; and

the coefficient of friction is a maximum coefficient of friction measured relative to a second glass container in a vial-on-vial testing jig under a normal load of 30 N, the second glass container having a body formed from the Type I, Class B glass composition and comprising the lubricous coating on an at least a portion of the outer surface of a body of the second glass container and subjected to the same environmental conditions prior to measurement.

13. The glass container of claim 12, wherein the lubricous coating is thermally stable at a temperature of at least about 280°C for 30 minutes.

14. The glass container of claim 12, wherein the compressively stressed layer has a surface compressive stress greater than or equal to 150 MPa.

15. The glass container of claim 12, wherein the compressively stressed layer has a depth of layer greater than or equal to 25 μm.

16. The glass container of claim 12, wherein the lubricous coating is positioned on at least a portion of the outer surface of the body.

17. The glass container of claim 16, wherein the portion of the outer surface of the body with the lubricous coating has a coefficient of friction less than or equal to 0.7.

4. The glass container of claim 1 or claim 3, wherein the tenacious organic coating is thermally stable at a temperature of at least about 300°C for 30 minutes.

5. The glass container of claim 1 or claim 3, wherein the compressively stressed layer has a surface compressive stress greater than or equal to 150 MPa.

6. The glass container of claim 1 or claim 3, wherein the compressively stressed layer has a depth of layer greater than or equal to 25 μm.

7~~18~~. The glass container of claim ~~12~~1 or claim 3, wherein a light transmission through the portion of the body with the lubricous coating is greater than or equal to about 55% of a light transmission through an uncoated glass article for wavelengths from about 400 nm to about 700 nm.

~~19. The glass container of claim 12, wherein the lubricous coating has a mass loss of less than about 5% of its mass when heated from a temperature of 150°C to 350°C at a ramp rate of about 10°C/minute.~~

820. The glass container of claim 121 or claim 3, wherein the lubricous coating comprises a polymer chemical composition and a coupling agent.

921. The glass container of claim 820, wherein the lubricous coating comprises:

a coupling agent layer positioned on the outer surface of the body, the coupling agent layer comprising the coupling agent; and

a polymer layer positioned over the coupling agent layer, the polymer layer comprising the polymer chemical composition.

~~22. A glass container comprising:~~

~~a body formed from a Type I, Class B glass composition according to ASTM Standard E438-92, the body having a hydrolytic resistance of HGB2 or better according to ISO 719 and an inner surface, an outer surface and a wall thickness extending between the outer surface and the inner surface;~~

~~a compressively stressed layer extending into the wall thickness from at least one of the outer surface and the inner surface, the compressively layer having a surface compressive stress greater than or equal to 150 MPa and a depth of layer greater than or equal to 25 μm; and~~

~~a lubricous coating positioned on a portion of at least one of the outer surface and the inner surface of the body, wherein the lubricous coating is thermally stable at a temperature of at least about 260°C for 30 minutes.~~

~~23. The glass container of claim 22, wherein the lubricous coating is thermally stable at a temperature of at least about 280°C for 30 minutes.~~

~~24. The glass container of claim 22, wherein the lubricous coating is positioned on at least a portion of the outer surface of the body.~~

~~25. The glass container of claim 22, wherein the portion of the outer surface of the body with the lubricous coating has a coefficient of friction less than or equal to 0.7.~~

~~26. The glass container of claim 25, wherein a light transmission through the portion of the body with the lubricous coating is greater than or equal to about 55% of a light transmission through an uncoated glass container for wavelengths from about 400 nm to about 700 nm.~~

~~27. The glass container of claim 22, wherein the lubricous coating has a mass loss of less than about 5% of its mass when heated from a temperature of 150°C to 350°C at a ramp rate of about 10°C/minute.~~

~~28. The glass container of claim 22, wherein the lubricous coating comprises a polymer chemical composition and a coupling agent.~~

~~29. The glass container of claim 28, wherein the lubricous coating comprises:~~

~~a coupling agent layer positioned on the outer surface of the body, the coupling agent layer comprising the coupling agent; and~~

~~a polymer layer positioned over the coupling agent layer, the polymer layer comprising the polymer chemical composition.~~

10~~30~~. The glass container of claim 9~~28~~, wherein the coupling agent comprises at least one of:

a first silane chemical composition, a hydrolysate thereof, or an oligomer thereof; and

a chemical composition formed from the oligomerization of at least the first silane chemical composition and a second silane chemical composition, wherein the first silane chemical composition and the second silane chemical composition are different chemical compositions.